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PD

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
|-----------------|-------------|----------------------|---------------------|
| 09/076,956      | 05/13/98    | BARANOVA             | L P60188US1         |

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HM12/0823

EXAMINER

CRANE, L

ART UNIT

1623

PAPER NUMBER

13

DATE MAILED:

08/23/99

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

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## Office Action Summary

Application No.

09/076,956

Applicant(s)

Baranova et al.

Examiner

L. e. Crane

Group Art Unit

1623

--The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address--

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ---3--- MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

## Status

- ☒ Responsive to communication(s) filed on 06/25/99 (Amdt D)
- ☒ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- ☒ Claim(s) 48-79 is/are pending in the application.
- Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- ☒ Claim(s) 48-79 is/are rejected.
- ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- ☐ Claim(s) \_\_\_\_\_ are subject to restriction or election requirement.
- ☒ Claims 18-47 have been cancelled.

## Application Papers

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been received.
- ☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.
- ☐ received in this national stage application from the International Bureau (PCT Rule 1.7.2(a)).

\*Certified copies not received: \_\_\_\_\_

## Attachment(s)

- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_ ☐ Interview Summary, PTO-413
- ☒ Notice of Reference(s) Cited, PTO-892 ☐ Notice of Informal Patent Application, PTO-152
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948 ☐ Other \_\_\_\_\_

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The Group and/or Art Unit location of your application in the PTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Group 1600, Art Unit 1623.

5        Claims **18-31** have been cancelled and new claims **32-47** were entered as per the amendment filed February 5, 1999. A revocation and substitution of power of attorney was entered June 1, 1999 and notification of acceptance was mailed June 15, 1999. Subsequently, claims **32-47** were cancelled and claims **48-79** were entered as per  
10      the amendment of June 25, 1999.

Claims **48-79** remain in the case.

Claims **48-79** are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the  
15      invention.

In claims **48-79**, line 1, the term "universal" is superfluous, because the patentable weight of the instant claimed subject matter is not altered by its removal from any one of the instant claims.

In claim **48**, lines 2 and 8, the term "under a first set of  
20      reaction conditions" is a process claim limitation, but not a compound claim limitation, and is therefore improper within the instant claim. Said term is also improper because of the status of the instant application as a "divisional" wherein the "process" claims are non-elected subject matter. Applicant is respectfully requested to delete  
25      both occurrences of said term.

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In claims **48**, line 2, the term "comprises" is incorrect in the instant claim because said term implies that the chemical structure of the compound being claimed contains additional structural component(s) not defined in the claim, i.e. implies that the metes and bounds are indefinite. Applicant is respectfully requested to substitute narrow language such as -- consisting of -- or the like for the noted term. The same problem reoccurs in claims **63-65** and **76-79**.

In claim **48**, lines 6-8, the term "Fn" is defined in functional terms which fail to provide the ordinary practitioner with adequate guidance to determine which "oxygen" containing functionalities which are included, and which "oxygen" containing functionalities which are not included, within the metes and bounds of the instant definition.

In claim **48**, lines 9-11, the term "Nu" is defined in functional terms which fail to provide the ordinary practitioner with adequate guidance to determine which "nucleophile" containing functionalities are included, and which "nucleophile" containing functionalities are not included, within the metes and bounds of the instant definition.

In claim **48**, line 11, the term "under a second set of reaction conditions" is a process claim limitation, but not a compound claim limitation, and is therefore improper within the instant claim. Said term is also improper because of the status of the instant application as a "divisional" wherein the "process" claims are non-elected subject matter.

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In claim 48, lines 12-20, the definitions of variables "R<sub>1</sub>", "R<sub>2</sub>", "R<sub>1</sub>'" and "R<sub>2</sub>'" are completely functional and include improper process limitations ("solid phased reaction conditions", two occurrences) and therefore are lacking in the adequate guidance required by the ordinary practitioner to determine what functional groups are properly included with the respective metes and bounds of the instant variables, and which functional groups are not properly included within the respective metes and bounds of the instant variables.

In claim 48, line 9, the term "Nu is a protected or unprotected nucleophile which when unprotected is capable of cleaving the 3', or 5' phosphate, phosphite or phosphorothioate group" is definitionally inconsistent with the subject matter of claim 50 wherein the functional groups defined as "Nu" fail to include any variables or further definitions of where said "nucleophiles" functions may be protected and with what protecting groups. For this reason the definition of "Nu" is deemed to be incomplete in both claims 48 and 50.

The definition of "Nu" in claim 50 to include "halogen" represents an obviously inoperative embodiment. A similar problem reoccurs in claim 69.

In claim 51, line 3, the term "halogenated derivatives thereof" by definition must include  $\alpha$ -halo compounds, a notoriously well known class of carcinogenic and highly hydrolysis sensitive alkylating agents when the group is for example --O-CH<sub>2</sub>-X-- . Applicant is respectfully requested to avoid such well known inoperative

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embodiments. The same problem or a very similar problem reoccurs in claims **57-58, 62, 67-70 and 73-75.**

In claim **52**, lines 1-2, the term "wherein  $R_1'$  is the organic or inorganic polymer" is technically incorrect and/or incomplete, because any such polymer must be bound to the generic linking structure making the polymer chemically a substituent radical, not a compound as defined by the noted term. Applicant is respectfully requested to re-define the noted term and include therewith a more complete definition concerning the structure(s) of the linkage which chemically binds the polymer to the generic structure of claim **48** through the bonding at the location defined by variable  $R_1'$ . The same problem reoccurs in claim **54.**

In claim **53**, the term "wherein  $R_1'$  is an atom or chemical moiety inert to solid phase reaction conditions coupled to the organic or inorganic polymer" is technically incorrect and/or incomplete. Said definition is inconsistent with the definition of claim **51** because the polymer has not been specified as a separate variable, e.g. --  $R_1'$  is optionally  $R_X-Y$  wherein  $R_X$  is a linking moiety and  $Y$  is a polymeric support -- or the like. The same problem reoccurs in claim **55.**

Claim **56** in its use of the term "heterocycle" is incomplete because the claim fails to include any further definition of which atom or atoms of the implied ring is/are a heteroatom(s), what is the intended upper limit of ring size, and which heteroatoms are intended. The same problem reoccurs in claim **59.**

In claim **60**, the term "wherein said heterocycle is a ribose ring" is incomplete for failure to specify all of the structural details of the

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"ribose ring" and the linkage(s) thereof to the other component parts of the claimed solid support. A similar problem reoccurs in claim **71**.

5 In claim **61**, the term "wherein Nu protected with a protecting group is" is technically incorrect and/or incomplete. Said definition is inconsistent with the definition of "Nu" in claim **60** because the protecting group has not been specified as a separate variable, e.g. -- Nu is optionally  $G_X-Z$  wherein  $G_X$  is a divalent oxygen and Z is a protecting group -- or the like. The same or very similar  
10 problem reoccurs in claims **63-65, 67, 69, 71-72 and 76-79**.

In claims **67 and 69**, the term "one or more" is indefinite for lack of an upper bound. Applicant may chose to limit the number of carbons in the definitions of "Alkyl" and "Acyl" to effectively address this problem.

15 In claims **63-85 and 77-79**, the term "alkyl" included within the definition of variable "X" is incorrect. Did applicant intend the term --  $\alpha,\omega$ -alkylenyl -- wherein the presence of two terminal radicals permits chemical bonding to both the solid support and to the functionalized linker?

20 Claims **48-79** are rejected under 35 U.S.C. §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

25 Instant independent claims **48, 63-65 and 76-79** are each drafted with functional limitations which imply a breadth of claim

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scope which encompasses exemplifications not enabled within the instant disclosure. For this reason, all of the instant claims (48-79) are lacking adequate supporting enablement within the instant disclosure because the number of specific embodiments presented is  
5 insufficient to adequately enable such broad claim scope.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. §102 that form the basis for the rejections under this section made in this Office action:

"A person shall be entitled to a patent unless -

- 10 (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent."
- (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more  
15 than one year prior to the date of application for patent in the United States."

Claims 48, 50, 52-55, 57-58, 62, 65, 67, 69, 73-75, 76 and 79 are rejected under 35 U.S.C. §102(a) as being anticipated by Lyttle et al. (PTO-892 ref S). (See also the US patent equivalent  
20 5,688,940, now PTO-892 ref. H).

The instant claims are directed to compounds which include a function "Nu" which is deemed to read on one or more of the compounds numbered 1, 4 and 5 as disclosed in the Lyttle et al. reference at Fig. 1, col. 1, of p. 2795.



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Claims 48, 50, 52-55, 57-58, 62, 65, 67, 69, 73-75, 76 and 79 are rejected under 35 U.S.C. §102(b) as being anticipated by Nelson et al. (PTO-892 ref. Y).

5 Applicant is referred to p. 7188, Figure 1 wherein the structure labeled "MF-CPG" (final product) anticipates the instant noted claims.

Claims 48, 50, 52-55, 57-58, 62, 65, 67, 69, 73-75, 76 and 79 are rejected under 35 U.S.C. §102(b) as being anticipated by Vu et al. (PTO-892 ref. V).

10 Applicant is referred to p. 604, Figure 1, the compounds labeled with numbers 5, 8, 13, 19, 28 and 32, each of which anticipate applicant's invention. Applicant will note with the abstract discussion to the effect that the phthalimido protecting group was inserted herein to prevent "spontaneous cleavage" of the  
15 oligonucleotides from the solid support.

The following is a quotation of 35 U.S.C. §103(a) which forms the basis for all obviousness rejections set forth in this Office action:

20 "A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made."

25 Claims 48, 50, 51, 52-55, 56, 57-58, 59, 62, 63-64, 65, 67, 68, 69, 70, 73-75, 76, 77-78 and 79 are rejected under 35

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U.S.C. §103(a) as being unpatentable over Lyttle et al. (PTO-892 ref S). (See also the US patent equivalent 5,688,940, now PTO-892 ref. H).

5 Lyttle et al. reference at Fig. 1, col. 1, of p. 2795 discloses derivatized solid supports which read on the instant claimed derivatized solid supports as noted supra. The instant reference does not include, i) N-alkyl analogues and ii) embodiments wherein the protected amino function and the solid support are connected by a moiety containing a cyclic structure which serves only a connecting  
10 function.

The disclosure in the prior art of a derivatized solid support which contains all of the chemically reactive elements of the instant invention but contains a structurally connecting element which serves no other than a connecting function which is never structurally  
15 cyclic, and which fails to contain an N-alkylated amino group is deemed to render the instant claimed derivatized solid support prima facie obvious in the absence of a sworn showing of unexpected results associated with the presence of the cyclic connecting element and or the N-alkylamino functionality, which are found in the  
20 claimed invention but not in the prior art.

Therefore, the instant claimed derivatized solid supports would have been obvious to one of ordinary skill in the art having the above cited references before him at the time the invention was made.

25 In view of the disclosure of Vu et al. concerning unanticipated cleavage of ODN's from the solid support, both the Vu and Nelson references are deemed to be equivalents of the Lyttle reference.

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Therefore, this paragraph is considered to be the equivalent of obviousness rejections citing the relevant portions of Vu and Nelson in place of Lytle in the rejection supra.

5 References made of record but not cited above are deemed to be either equivalents to the cited references or to be of interest as closely related prior art which shows the state of the relevant prior art.

10 Applicant's amendment necessitated the new grounds of rejection. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 C.F.R. §1.136(a).

15 A SHORTENED STATUTORY PERIOD FOR RESPONSE TO THIS FINAL ACTION IS SET TO EXPIRE THREE MONTHS FROM THE DATE OF THIS ACTION. IN THE EVENT A FIRST RESPONSE IS FILED WITHIN TWO MONTHS OF THE MAILING DATE OF THIS FINAL ACTION AND THE ADVISORY ACTION IS NOT MAILED UNTIL AFTER THE END OF THE THREE-MONTH SHORTENED STATUTORY PERIOD, THEN THE SHORTENED STATUTORY PERIOD WILL EXPIRE ON THE DATE THE ADVISORY ACTION IS MAILED, AND ANY  
20 EXTENSION FEE PURSUANT TO 37 C.F.R. §1.136(a) WILL BE CALCULATED FROM THE MAILING DATE OF THE ADVISORY ACTION. IN NO EVENT WILL THE STATUTORY PERIOD FOR RESPONSE EXPIRE LATER THAN SIX MONTHS FROM THE DATE OF THIS FINAL ACTION.

25 Note to applicant: The submission of a portion of the textbook authored by J. March is noted, but cannot be made of record because the date of publication has not been included within the

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instant submission. Applicant is encouraged to resubmit the reference and list author, title and pages submitted of same together with publisher, location and date of publication on a PTO-1449 so that same may be made of record.


5 Papers related to this application may be submitted to Group 1600 via facsimile transmission(FAX). The transmission of such papers must conform with the notice published in the Official Gazette (1096 OG 30, November 15, 1989). The telephone numbers for the FAX machines operated by Group 1600 are **(703) 308-4556** and  
10 **703-305-3592** .

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner L. E. Crane whose telephone number is **703-308-4639** . The examiner can normally be reached between 9:30 AM and 5:00 PM, Monday  
15 through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor can be reached at **(703)-308-1235**.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group 1600 receptionist whose  
20 telephone number is **703-308-1235** .

LECrane:lec  
8/22/99

  
L. Eric Crane  
Patent Examiner  
Group 1600